AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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CONTENTS

BHC Plant Capacity Increased 96
Plant Disease Toll Can Be Reduced 96
Foliage Feeding May be Extended 97
Methoxychlor Tested for Alfalfa Pests 100
Origins of Some of Newer Fungicides 101
Nutritional Value of Lysine Demonstrated 104
Controlling "Forest Predators" 105
Nylon Plant To Be Built in North Carolina 109
New Plastics Unit Put Into Operation 110

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BHC PLANT CAPACITY GREATLY INCREASED

A large increase in its capacity to produce benzene hexachloride for the control of cotton pests has been announced by the Du Pont Company.

The capacity of its benzene hexachloride plant has been increased by more than 9,000,000 pounds per year over what it was designed to produce when it went into operation early in 1949. This was made possible through engineering changes, improvements in processing techniques, and operating "know how" acquired since Du Pont began making it on a laboratory and pilot-plant scale.

Although benzene hexachloride was known in Europe more than 100 years ago, its properties as an insecticide were only discovered in 1942 by British scientists. Today it is one of the most effective insecticides known for combatting the major cotton pests. Many farmers know it as "Lexone" insecticide, or as an ingredient in Du Pont Cotton Dust No. 10, which also contains DDT and sulfur.

PLANT DISEASE TOLL PLACED AT TWO BILLION ANNUALLY

Some 50,000 plant diseases are costing American farmers two billion dollars each year, says Arden Sherf, extension plant pathologist at Iowa State College, Ames, Iowa.

Of that total, corn has 114 of the diseases, potatoes 127, wheat 88, and apples 200. Many farmers believe that the blights or rusts which attack their crops are due merely to unfavorable weather conditions. Actually, the cause nearly always is a living fungus, bacterial, or virus organism.

In the past, plant disease epidemics have caused great changes in the kinds of crops grown in certain districts, and they have even caused the movement of large numbers of people from one country to another.

Fortunately most plant diseases do not reach epidemic proportions. Much can be done easily and economically to control many of the common diseases. Good control often can be had by planting treated seed and resistant varieties of crops, according to Sherf.

SPRAYING NUTRIENTS THROUGH LEAVES MAY SOLVE SOME OF PROBLEMS IN CARING FOR SHADE TREES ON CITY STREETS

Getting trees to grow along sidewalks on a busy city street is no easy task. Every possible disadvantage to good tree growth is generally present in such cases.

Dr. P. P. Pirone, of the New York Botanical Garden, in an article entitled "Now They're Feeding Plants Through the Leaves" in the May-June, 1950, issue of POPULAR GARDENING, published at Albany, N. Y., ventures the prediction that some day city trees will be fed nitrogen through their leaves, in much the same way that many apple trees are now sprayed.

"Perhaps the greatest use of foliage feeding in the future," Dr. Pirone said, "will be for shade trees growing along city streets, where, because of impervious pavements beneath them, fertilizers cannot be added to the soil." He related that in 1949 extensive tests were made in New York City, with the cooperation of the New York Department of Parks, but the results were not conclusive because of the prolonged drought of that year.

Background of Leaf Spraying

According to Dr. Pirone, the new idea of feeding nutrients to trees through their leaves has some good precedents. He said that for many years such plants as "azaleas, pin oaks, and pineapples with yellow leaves, caused by an iron deficiency, have been sprayed with iron salts to cure the condition." Similarly, he noted that zinc deficiencies in citrus leaves have been corrected with a zinc spray, and that by spraying lettuce leaves with copper, it was possible to correct the "rabbit-ear" disease of lettuce. He added:

"Much of the credit for this revived interest in foliage feeding should go to the Cornell University fruit specialists who cooperated with the Du Pont Company in the development of urea sprays for apples."

Dr. Pirone said the Cornell workers have used the urea compound sold under the trade-mark "NuGreen" to supply the nitrogen needed to keep apple trees in good vigor. "NuGreen" contains 44% nitrogen in the form of urea.

"By spraying this material directly on the leaves", he said, "you need not apply a nitrogenous fertilizer to the soil in the old-fashioned way!

Tree Absorbs Nitrogen Rapidly

"It has been determined that nearly half of the nitrogen thus applied is absorbed by the plant leaves within an hour after application. The nitrogen thus absorbed starts to nourish the tree immediately. Apple leaves formerly deficient in nitrogen become darker green within a few days.

"Of course, one application of 'NuGreen' will not be sufficient to supply the tree's nitrogen needs for the whole season. As many as three or four applications at periodic intervals are necessary. This does not increase the orchardist's costs, however, inasmuch as he must make numerous spray applications to control insects and fungi anyway. He can add the nutrients directly to the spray tank containing the pesticides and thus do two jobs at once."

Dr. Pirone pointed out that the Ra-pid-gro Corporation, of Dansville, New York, "has long advocated spraying fertilizers directly to leaves." It manufactures "Ra-pid-gro", a completely water-soluble chemical fertilizer, containing 23% nitrogen, 21% phosphoric acid, and 17% potash. "Its formula," Dr. Pirone said, "contains all the essential minor elements in addition to the 'big three', nitrogen, phosphoric acid and potash. The nitrogen in this formula is carried as urea. Many favorable reports on the use of 'Ra-pid-gro' have been received from nurserymen over the past several years."

Botanical Garden Experiments Described

Both "Ra-pid-gro" and "NuGreen" were used by Dr. Pirone in intensive experiments with roses and chrysanthemums at the New York Botanical Garden in Bronx Park during 1949.

Using Red Radiance roses, he found that the treated ones grew taller, had more buds, and better and more luxuriant leaves, than the control bushes, which were untreated.

Results of the experiments with chrysanthemums, both in the greenhouse and outside, "were even more striking," Dr. Pirone said in his POPULAR GARDENING article.

Careful controls were established in the indoors experiment. Thirty-six plants of the cascade variety Jean Hart were used. They all came from the same stock plant. They were trained on slanting wires, so that the sprays would not drip back into the soil.

Striking Results Obtained

"Once established," he said, "12 of the plants were sprayed six times at weekly intervals with 'NuGreen', 12 with 'Ra-pid-gro' and 12 were left unsprayed ... The difference in foliage size and color soon became obvious. By the time the tests were completed ... the unsprayed plants showed yellowed leaves, particularly on the lower stems, and the upper foliage looked only fair, whereas the plants sprayed with 'NuGreen' and 'Ra-pid-gro' had larger, deeper green foliage. Some of the leaves treated with 'NuGreen' showed a very slight marginal burn, those with 'Ra-pid-gro' none. The burning probably occurred on these plants because of the rather tender foliage. None was noted on outdoor mums sprayed with 'NuGreen.'

"Numerous other tests on outdoor chrysanthemums, as well as on various ornamentals grown both indoors and out, convinced me that this is a way the average gardener can improve the quality of his plants without greatly increasing costs. Roses and chrysanthemums, like apple trees, must be sprayed many times during the season to control the many pests and diseases to which they are subject. With little extra cost, the home gardener can add the proper amount of nutrients to the spray tank and thus achieve pest control and obtain more vigorous plants at the same time."

MOVIE ON FUNCTIONAL USE OF COLOR RELEASED

"The Case for Color," a new 25-minute, 16 mm. sound movie in color explaining "Color Conditioning" -- the Du Pont Company's painting plan --has been released. Showings to interested parties may be arranged without cost by writing to the Finishes Division at Wilmington, Del. "Color Conditioning" involves the functional use of color wherever people work or congregate. The movie shows its application in schools, industrial plants, hospitals, stores, offices, restaurants, hotels, and other buildings.

METHOXYCHLOR FAVORED OVER DDT FOR UTAH ALFALFA PESTS

Methoxychlor is now being given a preferred position over DDT as a recommended insecticide to protect Utah alfalfa fields against onslaughts of weevils, lygus bug nymphs and other crop destroyers. This change in suggested insecticides is the result of extensive tests recently completed at the Utah Agricultural Experiment Station at Logan.

The tests were described by Dr. Clyde Biddulph of the Logan station at a recent session of tolerance hearings being conducted by the U. S. Food and Drug Administration in Washington, D. C. He said they showed conclusively that cows fed hay from DDT-treated alfalfa fields accumulated a build-up of the toxic material in various tissues and also secreted the material in their milk.

Feeding tests with hay from fields where methoxychlor had been used to control insects were also conducted. They showed no trace of this insecticide in tissues, blood, internal organs or milk of the animals after four months consumption of the treated hay. As a result, methoxychlor has been designated as a safe material to use on alfalfa grown for dairy cattle feeding, eliminating harmful substances from milk, Dr. Biddulph declared.

How Tests Were Made

Groups of dairy cows in the Utah experiments were fed hay from fields on which treatments had been applied containing one, two and three pounds of methoxychlor per acre respectively. Hay from each field was analyzed to determine the methoxychlor residue present. Hay from the field treated at one pound methoxychlor per acre showed 7 parts per million (ppm) of the insecticide; from the field treated with two pounds per acre, 9½ ppm; from the field treated with three pounds per acre, 14 ppm.

The cows in the test groups were fed this methoxychlor-treated hay for a four-month period. Milk samples were taken periodically during this time. No methoxychlor was found in the milk at any period during the test. Tissues were analyzed at the end of the four-month test, with no methoxychlor being found in the blood, kidney, liver, muscle or fatty tissues of the animals.

Dr. Biddulph also pointed out that methoxychlor has given excellent control of the insects attacking Utah alfalfa fields.

DERIVATIVES OF DITHIOCARBAMIC ACID AS FUNGICIDES *

By Dr. Wendell H. Tisdale and Dr. Albert L. Flenner,
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Fungi cause losses estimated at more than a billion dollars annually in this country. The mildews, rusts, smuts, blights, scab and rots of plants, the stain and decay of wood, and the molds of food and of many household and storage products are examples of the ravages of fungi, tiny thread-like plant growths. Some of the fungi attack man and animals, causing skin infections such as ringworm, athlete's foot, and other diseases. There are literally hundreds or even thousands of species of fungi. Each of these species has its own peculiar habits of growth and of food requirements. There are even different varieties or strains within a species, and each of these has its own plant or animal host or hosts on which it lives.

To reduce or prevent the heavy losses due to fungus attacks, control measures are necessary. Chemical treatment is one of the leading means of control. Sprays, dusts, and dips are practiced. Chemical treatment is not new. The Greek poet, Homer, mentioned "pest averting sulfur" about 1,000 years B.C. Progress, however, in the development of fungicides was slow. Often the cure was worse than the disease.

In the past few decades research has answered many of the baffling questions concerning fungi and the damage caused by them. Much also has been learned about the weak and strong points of the old, commonly used fungicides

* Abstract of paper presented at a symposium on Newer Developments in Fungicides, Division of Agricultural and Food Chemistry of the American Chemical Society, at Philadelphia, Pa., April 12, 1950.

such as the copper, sulfur, mercury, and formaldehyde products. The results of these studies have convincingly shown the need for better fungicides for many uses.

Many Participate in Search for Better Fungicides

The chemical industry joined hands with state and federal experimental stations and other research institutions to help supply the answers to these important needs. The search is for fungicides that will effectively prevent or control the important plant disease and other fungus troubles without causing injury to the plants or to animals, including humans who may handle or consume the treated products.

The Du Pont research laboratories in 1931, while investigating organic sulfur compounds, found that some of the derivatives of dithiocarbamic acid (a sulfur-containing acid) which were used in the rubber industry possessed high fungicidal value. The extensive cooperative research on this group of compounds has resulted in the development of what is now considered to be the most important and versatile group of organic fungicides in use. They may be compared in importance to DDT and its relatives in the insecticide field. These new fungicides are replacing the old standard products for many uses, and they are filling important unfilled needs. Short, common names have been given to the chemicals of this group now in use as fungicides in order to avoid the use of the awe-inspiring technical names. These common names refer to the active chemicals and are not intended to replace the trade-marks of the formulated fungicides made from them.

Effective Seed Disinfectant Developed

Thiram, an organic dithiocarbamic acid derivative, has proved highly effective as a seed and soil disinfectant. When suitably formulated, thiram is outstanding as a treatment for seed corn, peanuts, onion seeds, and other vegetable seeds. It protects against seed- and soil-borne organisms that cause seed decay and seedling infections such as damping-off of seedlings and does not injure the seed. It also is effective as a soil treatment for the control of root rot of sugar beets.

Another product containing thiram is used effectively for the control of brown patch and snow mold of turf grasses on lawns and golf greens.

Fungicide for Fruit and Tobacco

Ferbam, an iron salt of dithiocarbamic acid, is especially attractive for control of many fruit diseases. No other product has matched its effectiveness for the control of cedar rust of apples. It also is attractive for the control of apple scab, pear scab, brown rot of cherries, cranberry fruit rots, and certain other diseases of fruits. It is the leading product for the control of tobacco blue mold, and for black spot of roses. Ferbam is much safer to use on plants than some of the older fungicides.

Ziram, the zinc salt corresponding to the iron salt ferbam, has found its greatest usefulness in the control of vegetable crop diseases. It is excellent for the control of anthracnose and the leaf diseases of tomatoes, beans, cucumbers, and melons. Ziram is very effective for the control of the leaf diseases of celery. It also controls the brown rot of peaches. Ziram is safe to plants except those that are known to be zinc sensitive and for which it is not recommended. Plants grown in zinc deficient soils may show improvement when treated with Ziram.

High Crop Yields from Treated Plants

Zineb is a zinc ethylene bis salt of dithiocarbamic acid. Zineb or the corresponding sodium salt, nabam, when used with zinc sulfate added to the spray tank, is a superior fungicide for the control of late blight of potatoes and tomatoes.

The crop yields from plants treated with these new fungicides are often surprisingly high as compared with plants treated with the old standard fungicides or from plants which are not treated. This is probably due to the fact that the new products do not cause injury or such growth-depressing effects as may be caused by copper and sulfur fungicides.

One of the interesting facts about the broadening ownership of American industry is that women now outnumber men among the 14,000,000 stockholders in many U. S. corporations. One authority estimated recently that 75 per cent of industry is owned by women.

About 57 per cent of the individuals among Du Pont's 118,000 shareholders are women. They include a cross-section of the women of the average U. S. community - housewives, teachers, nurses, business-women, etc.

EXPERIMENTS SHOW NUTRITIONAL VALUE OF BREAD FORTIFIED WITH SYNTHETIC LYSINE

CHICAGO -- Rats fed on bread fortified with synthetic lysine were found to grow at a substantially greater rate than control animals fed on the same type of bread without added lysine, it was reported here recently in a paper by Hans R. Rosenberg and Edward L. Rohdenburg of the Organic Chemicals Department of E. I. du Pont de Nemours & Company.

"Also", said Dr. Rosenberg in presenting the paper before the division of agricultural and food chemistry of the American Chemical Society, "rats receiving the basal bread diet never attained weights equal to the weights of the animals receiving additional lysine".

Amino Acids Essential to Growth

Lysine is one of the eight amino acids which, because they serve as "building blocks" in the growth of muscle, nerve, and other body tissues, are essential to human nutrition. In the human or animal body, the speaker explained, proteins from various foods are broken down chemically into their respective amino acids. These molecular building blocks are absorbed, circulated in the blood stream, and re-synthesized into the proteins which comprise various body tissues.

Wheat protein is known to be relatively low in lysine, and, as a result of milling, the proteins in wheat flour are even more deficient in this necessary amino acid. Experiments showed that synthetic lysine added to flour undergoes only small losses when baked in bread.

"A diet comprising adequate amounts of meat, milk, cereals, eggs, and bread contains all the lysine needed to insure proper nutrition", Dr. Rosenberg said. "The promising results obtained with rats nevertheless suggest that bread fortified with synthetic lysine deserves serious consideration if it should ever become necessary to improve human nutrition by an increased intake of this essential amino acid."

A new illustrated booklet has been issued by Du Pont showing how to improve pine timber stands by killing undesirable trees with "Ammate" weed killer. Copies may be obtained without charge from the Editor, Agricultural News Letter, Wilmington 98, Delaware.

CONTROLLING "FOREST PREDATORS" originally appeared in the August, 1950 issue of AMERICAN FORESTS, published by The American Forestry Association, of Washington, D. C. It is reprinted here with the permission of the editors. The author, Dr. Arne E. Carlson, is on the staff of the Agricultural Chemicals Section, Grasselli Chemicals Department, E. I. du Pont de Nemours & Company, Cleveland, Ohio.

CONTROLLING "FOREST PREDATORS"

Here is the story of "Ammate" weed killer, the ammonium sulfamate compound that may help solve the scrub hardwood problem in the pine growing region of the South

By DR. ARNE E. CARLSON

A self-styled "nature lover" in a noon luncheon conversation visibly shuddered as we discussed methods of killing unwanted trees. Destruction of any tree, unless necessary for the production of lumber, or to provide space for a construction project, he considered little short of a crime.

Others of us around the table were, I feel sure, as fond of beautiful trees as the fellow who protested. But we were also aware of certain practical aspects of good forestry.

"Why," we asked him, "do you suppose the government pays hunters to kill certain predatory animals?"

Predatory Tree is Like Predatory Animal

Of course he knew the answer to that--the need to protect deer and small game as well as domestic herds of livestock from these predators. But it opened an entirely new field of thought to him when we compared certain trees to these animal predators, explaining that one large blackjack or post oak in a valuable pine stand can take as much room as fifteen to twenty saplings, eight to ten small poles, or two to four sawlogs.

Indeed, there seems a striking similarity between the understory of scrub hardwood in a pine forest which prevents the development of new pine seedlings, and the predatory animal that raids nests of pheasants, devouring the eggs and preventing the hatching of a future generation.

L. E. Chaiken, silviculturist of the Southeastern Forest Experiment Station, reports this exact condition in a recent study of the encroachment of hardwoods in southern pine stands.

His example is a well-stocked, pure loblolly stand in the Santee Experimental Forest in South Carolina. The pine timber is about fifty years old, with no fire record in fifteen years.

"A tally of the understory," he writes, "reveals over 5,000 hardwood stems per acre; about half are below breast height and the others mainly in the zero to one-inch class. There are also nearly 4,000 stems of woody shrubs per acre. Thus, there are about 9,000 competitors in the understory. But there are no pine seedlings, other than those that germinate during the current year.

"All overstory pines in the observed stand bear cones. About every other year these trees will produce a good, if not an abundant, supply of seed. Much of the seed is intercepted by the hardwood litter and fails to germinate. Those seedlings that become established are practically all short-lived because of the heavy competition from low hardwoods and shrubs."

Extensive Experiments With Chemicals

There, briefly, is the problem facing those who are looking to the future of the pine industry of the South.

In 1929, the Southern Forest Experiment Station started a series of tests with poisons to kill undesirable hardwoods in pine stands. In this case it was not a matter of brush control. The "game" being sought was the blackjack, post oak, or other "weed tree" whose branches, roots, and the very space it occupies rob pine seedlings of the soil, moisture, fertility and sunlight they require for maturity. In the majority of cases, these trees are not marketable, being gnarled, rough, with hollow heart or other defects.

Cutting out or simply girdling these trees has been a poor answer to the problem. From stump or roots the hardwoods send out sprouts which soon cover more area and crowd pine seedlings worse than do the parent trees.

In the early years of these experiments, such materials as ammonium nitrate, potassium nitrate, sodium nitrate, copper sulfate, zinc chloride, sodium chloride, sodium arsenite, creosote, and diesel oil were tried. Most effective of these--a real ray of hope in the battle against the "pine robbers"--was sodium arsenite. But the hazards of this chemical, which is deadly poison to all animal life, augured against its use.

Work With Ammonium Sulfamate

Meantime, research in the development of growth regulators had been carried on by chemists of the Du Pont Company. In 1944, they sent samples of a new material to the foresters for trial in combating these scrub hardwoods. It was an ammonium sulfamate compound, soon to be known as "Ammate" weed killer. In quantities required for tree killing, it was free of hazard to humans and animals, and soon won a reputation, in the words of Fred Peevy, forest ecologist of the Southern Forest Experiment Station, as "the most effective and versatile of all tree-poisoning materials." For it could be used either in dry crystalline form

or in solution, its defoliation effects were prompt, and its penetration of the root system, when applied in adequate amounts, inhibited sprouting.

Mr. Peevy has been prominent in the testing of "Ammate" and development of practical techniques to use this material. In this work he has been joined by other foresters at the nine branch research stations throughout the pine belt.

Today these specialists in forest management are supplementing their tree poisoning studies with experiments in spraying the brush understory. They're using such materials as "Ammate" weed killer, 2,4-D and 2,4,5-T at various concentrations. And it seems very likely that the ultimate recommendation which timber owners will adopt to protect the future of their pine stands will be a combination of poisoning the larger trees and spraying the brush and shrubs.

Offensive Against Hardwood Invaders

The importance of ridding their pine forests of these scrub hardwood pirates has been readily recognized by southern lumbermen, pulp and paper companies and other owners of timberland. Many of these operators have had tree-poisoning crews in the woods for several years now.

The reason for this serious offensive against the hardwood invaders is evident when you glance at figures compiled by forest economists. More than 100 million acres of southern forest land are being overrun by the "weed trees." Loss in pine development is estimated at from $2 to $3 an acre for every year these undesirables are allowed to crowd out profitable timber. This means an annual loss of from $200,000,000 to $300,000,000 to forest industry.

Both experimentally and in actual practice, a number of methods of applying "Ammate" to trees have been evolved. Most practical has been the "frill"--a complete ring of single ax strokes around the tree, cutting through the bark and into the sapwood, leaving an actual frill of wood into which "Ammate" solution can be poured. More effective but also more costly from a labor standpoint are "cups," made with two ax strokes, one about two inches above the other and prying out the chip between to leave a pocket into which crystals of "Ammate" weed killer may be deposited.

The lower the cups are placed, the less sprouting is likely to occur. Two cups on opposite sides are sufficient for a tree that is six inches or less in diameter at breast height. For larger trees, cups should be not more than six inches apart around the tree. A tablespoonful of crystals per cup should be applied for most of the common oak species.

Various Factors Affect Costs

Costs are difficult to specify, for this will depend on the number of trees per acre to be treated, and their size, plus the terrain of the country and the amount of brush that impedes the tree-poisoning crew.

One Louisiana operator treated 3500 acres two years ago, cutting all trees under five inches in diameter and poisoning the larger ones. On twenty acres where accurate costs were figured, the average for labor, supervision, tools and "Ammate" was $2.43 an acre. Another company in the same state kept figures on treating all trees six inches in diameter or larger on 3170 acres, and came out with an average of $2.30 an acre.

At Bigwoods Experimental Forest in Hertford County, North Caroline, all hardwoods five inches or larger in diameter were poisoned on about 150 acres. Trees treated per acre ran from sixteen to fifty and costs per acre varied from $1.44 to $3.40

Upland and Bottomland Problems Differ

One southern timberland operator, comparing the "Ammate" treatment in "frills" with two-hack girdling of the trees without any chemical treatment, declared that the total cost per tree was less and that results of the treatment were apparent sooner. Trees began losing their leaves a few days after being poisoned, he said, opening up the canopy above the stunted pine seedlings and allowing the pines to make good growth the first season after treatment.

Another Louisiana lumberman, whose company had treated over 1500 acres with a five-man crew, had an interesting comment on the effects of tree poisoning. Fire-fighting crews experience less trouble in getting through woods after hardwood growth has been poisoned, he stated. Where a tree has been girdled, the sprouts grow out in a mass and often block passage, whereas no sprouts were present when poison had penetrated the root system.

With small trees, more efficiently cut than poisoned, two ax strokes are used to leave a V-notched stump. Into this notch, crystals of "Ammate" weed killer are placed. These are absorbed into the roots and sprouting is inhibited.

This entire hardwood problem is bringing about an evolution in the thinking and plans of lumbermen. In some bottomland areas, where the encroaching hardwoods are of marketable types, and where the maintaining of a pine stand has become increasingly difficult, there may be a general conversion to hardwood forests on an economically sound basis. But much of the upland timber country is geared to pine production, its pocketbook slung over a low branch of the more rapidly growing pine crop. In these sections, the scrub hardwood must be looked upon as a "predatory tree" and dealt with accordingly if future generations of poles, pulpwood and sawlogs are to be produced.

DU PONT TO BUILD NEW NYLON PLANT WHILE EXPANDING CAPACITY OF OTHERS

The Du Pont Company has announced plans to build a new nylon plant near Kinston, N. C.

An option has been taken on a tract of approximately 635 acres on the Neuse River, between Kinston and Graingers, N. C., for the site of the new nylon yarn plant. The land is in Lenior County. Construction work is expected to start early in 1951, and approximately 18 months will be required for completion. It will be handled by the Engineering Department of the Du Pont Company. An estimated 800 men will be employed at peak of construction.

Approximately 1,200 people will be required to operate the plant when completed.

Martinsville and Other Plants Expanded

The Kinston plant will be Du Pont's fourth nylon yarn plant, and the ninth major expansion of its nylon manufacturing facilities since World War II.

At Martinsville, Va., more than 100,000 square feet of floor space will be added to the plant's present area of almost 500,000 square feet. The new space will be used to increase the size of the spinning, textile, inspection, and shipping areas. Approximately 300 new jobs will result from the expansion, to increase the plant's operating force to about 2,800 employees. Construction began in September and completion of the project is scheduled in 1952.

The capacity of the Martinsville plant originally, built in 1941, was virtually doubled by a major addition in 1945-46. At the same time, the company completed a new plant at Orange, Texas, for the manufacture of nylon's basic chemical intermediate known as "nylon salt". A third yarn plant was completed at Chattanooga, Tenn., in 1948. The Chattanooga plant is being expanded at present, as is the world's first plant at Seaford, Del. These projects are scheduled for completion early in 1951.

Construction is under way on a new plant for the production of nylon salt at Victoria, Texas, while capacity for other nylon manufacturing materials is being expanded at a unit of the Niagara Falls, N. Y., plant which was built in 1947-48.

DU PONT ENLARGES CAPACITY TO PRODUCE NEW PLASTIC WITH INTERESTING QUALITIES

A new unit of the Du Pont Company's plastics plant near Parkersburg, W. Va., has gone into commercial production of "Teflon" tetrafluoroethylene resin, an industrial plastic highly resistant to chemicals and heat and one of the best insulating materials known.

The new unit makes available to the chemical and electrical industries and other users of "Teflon" a productive capacity several times that of a plant at Arlington, N. J., where manufacture of the plastic in relatively small commercial quantities was started in 1943.

The unit's full operation marks completion of the first expansion at the Parkersburg plant which less than two years ago began commercial manufacture of nylon molding powder, monofilament and tapered bristles; "Lucite" acrylic resin, and "Alathon" polythene resin.

Embodied in the new unit is "Teflon" manufacturing know-how accumulated by Du Pont research in the last seven years. The manufacturing economies built into this unit have made price reductions possible.

Baking Industry Uses New Product

Granular "Teflon" was first sold at $18 a pound, a price reflecting then existing difficulties of manufacture and low production. It now sells for $6.50 a pound.

"Teflon" offers a combination of chemical inertness, heat-resistance, and electrical insulating properties available in no other single material. Development of the plastic has given the chemical industry corrosion-proof gaskets and valve packings that are essentially permanent, unless mechanically damaged. The electrical industry uses "Teflon" as insulation which will withstand continuously temperatures up to 500 degrees F., in motor windings and other applications. The baking and other industries use the plastic's non-adhesive property as an aid in processing sticky materials.

The manufacture of "Teflon" tetrafluoroethylene resin at Parkersburg begins with "Freon 22" fluorinated hydrocarbon, a gas, as the raw material. This is broken down by heat to yield tetrafluoroethylene monomer, which is purified by distillation and then reacted to produce "Teflon" by a process of polymerization, or the union of small molecules to make "giant" ones.

Further expansion of the plant is under way for the manufacture of the new "Teflon" suspensoid, a suspension of minute particles of the plastic in a liquid, from which wire extrusion compounds and enamels, and corrosion-resistant finishes have been developed.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

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